

Amendments to the Claims:

The following listing of claims is provided for convenience:

Claim 1 (currently amended): A system for providing dialysis comprising:

a patient fluid loop including a first pump, and multiple a first patient lumens lumen for providing fluid to the patient, and a second patient lumen for removing fluid from the patient;

a multiple lumen connector for connecting with the first and second patient lumens of the patient fluid loop, the connector configured to be sealed by a removable connector end cap such that the pump can prime the patient fluid loop prior to being connected to the patient;

a second fluid loop including a second pump, a medical fluid regenerator, and a gas separator that separates gases from the second fluid loop;

a membrane device in fluid contact with and separating the patient fluid loop and the second fluid loop, the membrane device allowing at least one selected component of the fluid in the patient fluid loop to transfer to the second fluid loop;

the second loop being closed except for the transfer of the selected component via the membrane device; and

a controller that operates the first and second pumps to recirculate fluid in the patient loop and the second loop.

Claim 2 (original): The dialysis system of Claim 1, wherein the membrane device is a dialyzer.

Claim 3 (original): The dialysis system of Claim 1, wherein a pressure gradient exists across the membrane device.

Claim 4 (original): The dialysis system of Claim 1, wherein the patient loop is closed except for the transfer of the selected component via the membrane device.

Claim 5 (original): The dialysis system of Claim 1, wherein the membrane device includes a nanofilter which allows urea to pass from the patient fluid loop to the second fluid loop.

Claim 6 (original): The dialysis system of Claim 1, wherein the medical fluid regenerator includes a uremic toxin sorbent.

Claim 7 (original): The dialysis system of Claim 1, wherein the medical fluid regenerator includes at least one of: urease, zirconium phosphate, zirconium oxide, and carbon.

Claim 8 (previously presented): The dialysis system of Claim 1, the gas separator being a first gas separator, and which includes a second gas separator that removes gas from the patient loop.

Claim 9 (previously presented): The dialysis system of Claim 1, wherein the gas separator and the medical fluid regenerator are provided in a single device.

Claim 10 (previously presented): The dialysis system of Claim 1, wherein the gas separator also separates gases from the patient fluid loop.

Claim 11 (original): The dialysis system of Claim 1, wherein the second fluid loop includes a multi-analyte sensor that monitors a concentration of electrolytes in the medical fluid.

Claim 12 (original): The dialysis system of Claim 1, wherein peritoneal dialysis fluid is circulated through the patient fluid loop.

Claim 13 (original): The dialysis system of Claim 1, wherein blood is circulated through the patient fluid loop.

Claim 14 (original): The dialysis system of Claim 1, wherein at least parts of the patient fluid loop and the second fluid loop are provided in a disposable device.

Claim 15 (original): The dialysis system of Claim 1, wherein the second fluid loop includes a balance chamber that balances flow within the second fluid loop.

Claim 16 (previously presented): The dialysis system of Claim 1, wherein the controller enables fluid to flow in opposite directions through the multiple patient lumens.

Claim 17 (original): The dialysis system of Claim 1, which includes a dual lumen catheter that defines the multiple patient lumens.

Claim 18 (original): The dialysis system of Claim 1, wherein at least one of the patient fluid loop and the second fluid loop includes an in-line fluid heater.

Claim 19 (original): The dialysis system of Claim 18, wherein the in-line fluid heater includes a radiant heater and a plate heater.

Claim 20 (previously presented): The dialysis system of Claim 1, which includes at least one optical medical fluid sensor that senses at least one indicator selected from the group consisting of: ammonia, ammonium and pH .

Claim 21 (original): The dialysis system of Claim 1, which includes a fluid volume sensor in at least one of the patient and second fluid loops.

Claim 22 (original): The dialysis system of Claim 21, wherein the fluid volume sensor includes a capacitance fluid volume sensor that uses a chamber in fluid communication with the at least one fluid loop.

Claim 23 (original): The dialysis system of Claim 22, wherein the chamber is a pump chamber.

Claim 24 (original): The dialysis system of Claim 1, which includes an ultrafiltrate container in fluid communication with at least one of the patient and second fluid loops.

Claim 25 (original): The dialysis system of Claim 1, which includes a fluid concentrate container in fluid communication with at least one of the patient and second fluid loops.

Claim 26 (original): The system of Claim 1, wherein the controller operates the first pump continuously to pump fluid into and out of a patient.

Claim 27 (withdrawn): A disposable dialysis cassette comprising:
a flexible membrane covering a patient pump chamber and a regeneration pump chamber;
means for fluidly connecting the patient pump chamber to a closed loop patient fluid path; and
means for fluidly connecting the regeneration pump chamber to a closed loop regeneration fluid path, wherein the patient path fluidly communicates with the regeneration path via a dialyzer.

Claim 28 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a dialysate sorbent cartridge.

Claim 29 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a gas separator.

Claim 30 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a dialysis concentrate container.

Claim 31 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a dialysate last bag.

Claim 32 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a dialysate bag.

Claim 33 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a drain container.

Claim 34 (withdrawn): The disposable dialysis cassette of Claim 27, which defines a fluid path that fluidly communicates with a patient fluid connector.

Claim 35 (withdrawn): A dialysis therapy device for use with a disposable cassette, the device comprising:

- a housing having a portion that receives the disposable cassette;
- a patient pump actuator in the housing that pumps fluid through a patient path defined at least in part by the disposable cassette; and
- a regeneration pump actuator in the housing that pumps fluid through a regeneration path defined at least in part by the disposable cassette.

Claim 36 (withdrawn): The dialysis therapy device of Claim 35, which includes at least one fluid volume measurement sensor component that cooperates with at least one of the patient pump actuator and the regeneration pump actuator.

Claim 37 (withdrawn): The dialysis therapy device of Claim 35, wherein the housing houses a fluid heater.

Claim 38 (withdrawn): The dialysis therapy device of Claim 35, wherein the housing houses at least one sensor selected from the group of: an ammonia sensor, an ammonium sensor and a pH sensor.

Claim 39 (withdrawn): The dialysis therapy device of Claim 35, wherein the housing houses at least one valve actuator that operates with the disposable cassette.

Claim 40 (withdrawn): A method of moving fluid in a dialysis system comprising the steps of:

continuously recirculating a first fluid through a patient loop;

continuously recirculating a second fluid through a regeneration loop;

transferring at least one waste component from the patient loop to the regeneration loop through a device shared by both loops, the loops being closed except for said transfer through said device; and

removing the at least one waste component from the regeneration loop.

Claim 41 (withdrawn): The method of Claim 40, wherein the first and second fluids include dialysate.

Claim 42 (withdrawn): The method of Claim 40, wherein the first fluid includes blood and the second fluid includes dialysate.

Claim 43 (withdrawn): The method of Claim 40, wherein removing the waste component includes flowing the second fluid in the regeneration loop through a waste sorbent and absorbing at least some of the waste component.

Claim 44 (withdrawn): The method of Claim 40, which includes the step of heating the at least one of the first and second fluids.

Claim 45 (withdrawn): The method of Claim 40, which includes the step of removing ultrafiltrate from at least one of the first and second fluids.

Claim 46 (withdrawn): The method of Claim 40, which includes the step of adding dialysate to at least one of the first and second fluids.

Claim 47 (withdrawn): The method of Claim 40, which includes the step of adding concentrate to at least one of the first and second fluids.

Claim 48 (withdrawn): The method of Claim 40, which includes the step of removing gas from at least one of the first and second fluids.

Claim 49 (withdrawn): The method of Claim 40, which includes the step of balancing the flow of fluid in at least one of the patient loop and the regeneration loop.

Claim 50 (withdrawn): The method of Claim 40, which includes the step of sensing a volume of flow of fluid in at least one of the patient loop and the regeneration loop.

Claim 51 (withdrawn): A method of moving fluid in a peritoneal dialysis system comprising the steps of:

continuously recirculating dialysate through a container in a patient loop;

continuously recirculating dialysate through the container in a regeneration loop; and

continuously moving at least one waste component from the patient loop to the regeneration loop through the container shared by both loops, the loops being closed except for the transfer through the container.

Claim 52 (withdrawn): The method of Claim 51, which includes the step of recirculating dialysate through the regeneration loop at a different rate than a rate at which dialysate is recirculated through the patient loop.

Claim 53 (withdrawn): A method of performing continuous flow peritoneal dialysis comprising the steps of:

continuously recirculating dialysate fluid through a closed patient loop;

continuously recirculating regeneration fluid through a closed regeneration loop;

passing the dialysate fluid and the regeneration fluid past opposite sides of a dialyzer membrane; and

regenerating the regeneration fluid after the regeneration fluid exits the dialyzer.

Claim 54 (withdrawn): The method of Claim 53, wherein recirculating dialysate fluid through the closed patient loop includes passing the fluid through a portion of a patient.

Claim 55 (withdrawn): The method of Claim 53, wherein recirculating dialysate fluid through the closed patient loop includes passing the fluid through a sleeping patient.

Claim 56 (withdrawn): The method of Claim 53, wherein recirculating dialysate fluid through the closed patient loop includes passing the fluid through a patient at nighttime.

Claim 57 (withdrawn): A method of performing continuous flow dialysis comprising the steps of:

performing continuous flow peritoneal dialysis with a closed loop dialysis device at a first point in time; and

performing continuous flow hemodialysis via the same closed loop dialysis device at a second point in time.

Claim 58 (withdrawn): The method of Claim 57, wherein the continuous flow peritoneal dialysis and the continuous flow hemodialysis are performed on the same patient.

Claim 59 (withdrawn): The method of Claim 57, which includes an intermediate step of removing a disposable cassette used with the device and coupling a new disposable cassette to the device.

Claim 60 (withdrawn): The method of Claim 57, which includes an intermediate step of removing a dual lumen peritoneal dialysis catheter and replacing said catheter with a hemodialysis needle.

Claim 61 (withdrawn): The method of Claim 57, which includes an intermediate step of removing a hemodialysis needle and replacing said needle with a dual lumen peritoneal dialysis catheter.

Claim 62 (new): The dialysis system of Claim 1, wherein the first patient lumen extends further into the multiple lumen connector than the second patient lumen

Claim 63 (new): The dialysis system of Claim 1, wherein the multiple lumen connector is configured to connect with a multiple lumen catheter.